The Earth's Surface

Grade 6

Text to be used:	The Earth's Surface (ES)
McDougal Littell & *Unit Resource Book (URB) where noted	

RI Statements of Enduring Knowledge - (Established Goals):

ESS1 - The Earth and earth materials as we know them today have developed over long periods of time, through continual change processes.

ESS2 - The earth is part of a solar system, made up of distinct parts that have temporal and spatial interrelationships.

PS2 - Energy is necessary for change to occur in matter. Energy can be stored, transferred, and transformed, but cannot be destroyed.

Related Rhode Island GSE's (Understandings)	**RI Assessment Targets** Assessment Evidence
ESS1 (5-6)–1 **Students demonstrate an understanding of processes and change over time within earth systems by …** **1a** identifying and describing the layers of the earth. ***1b*** *plotting location of volcanoes and earthquakes and explaining the relationship between the location of these phenomena and faults.* **Students demonstrate an understanding of characteristic properties of matter by …** **1a** measuring mass and volume of both regular and irregular objects and using those values as well as the relationship D=m/v to calculate density. **ESS1 (7-8)–3Students demonstrate an understanding of processes and change over time within earth systems by …** **3a** evaluating slow processes (e.g. weathering, erosion, mountain building, sea floor spreading) to determine how the earth has changed and will continue to change over time. **3b** evaluating fast processes (e.g. erosion, volcanoes and earthquakes) to determine how the earth has changed and will continue to change over time. 3c **investigating the effect of flowing water on landforms (e.g. stream table, local environment).**	***ESS1 (5-8) INQ+ POC –1*** **Use geological evidence provided to support the idea that the Earth's crust/lithosphere is composed of plates that move.** • Text Reference: Chapter 1.1 -1.4 pp.6-30 **(ES)** • Investigation: P.7 Explore; Using Modern Maps **(ES)** • Investigation:p.13 How can you model the geosphere's layers? • URB p.20 • Investigation: p.15 What makes a good map? **(ES)** • Math connection: Activity, p.23 How far is it? **(ES)** • Investigation: P.28 Topographic Maps **(ES)** • **URB P. 61-63** • Investigation: P. 32 Satellite imaging **(ES)** ***ESS1 (5-8) INQ+ POC –5*** *Using data about a rock's physical characteristics make and support an inference about the rock's history and connection to rock cycle.* • Text reference: 2.1 -2.3,pp. 40-61**(ES)** • Investigation: Explore: How do you turn water into a mineral and what makes up rocks? P.41 **(ES)** • Investigation: What are some characteristics of a mineral? P.43 **(ES)** • Investigation: How do crystals differ in shape? P.46 **(ES)** • **URB p.40** • Investigation; Hardness of minerals, p.56 **(ES)** • **URB p.102** • Investigation; 58-59 Mineral Identification, **(ES)** • Class discussion: Mineral Formation, reading diagram, p.63 **(ES)** • **Introduce density: No algebraic manipulations, just using concept and formula. This will again be used in grade 8.**

ESS1 (5-6)-5 **Students demonstrate an understanding of processes and change over time by …** **5a** representing the processes of the rock cycle in words, diagrams, or models. **5b** citing evidence and developing a logical argument to explain the formation of a rock, given its characteristics and location. (e.g. classifying rock type using identification resources	• Text reference: 3.0 -3.4 P.72-103 **(ES)** • Investigation: How can rocks disappear? p.73 **(ES)** • Investigation: How do rocks differ from minerals? P.75 **(ES)** • Investigation: How can rocks be classified? P.77 **(ES)** • **URB P> 153** • Class discussion: The rock cycle, pp.78-79 /Have students describe in writing the meaning of the diagram, p.79. **(ES)** • Class discussion: Crystal size and Cooling time, p.84 **(ES)** • **URB P.165**

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	Focus Questions (Essential Questions)	**Instructional Activities & Investigations (INQ)**	**Big Ideas** (Understandings)
1	**How has technology changed our view of the earth?**	• Text Reference: Chapter 1.0-1.1 -1.4 pp.6-30 **(ES)** • Investigation: P.7 Explore; Using Modern Maps **(ES)** • Investigation:p.13 How can you model the geosphere's layers? • URBP.20 • Investigation: p.15 What makes a good map? **(ES)** • Math connection: Activity, p.23 How far is it? **(ES)** • Investigation: P.28 Topographic Maps **(ES)** • **URB P.61-63** • Investigation: P. 32 Satellite imaging **(ES)**	• **Mapping** the Earth's surface • What are the layers of the **Geosphere?** • Earth has four main layers: **crust, mantle, outer core, and inner core** • All four parts of the Earth's system, **atmosphere, hydrosphere, geosphere, and biosphere** helped shape the earth's surface.
2	**What are characteristics used to identify minerals?**	• Text reference: 2.0 -2.3,pp. 40-61**(ES)** • Investigation: Explore: How do you turn water into a mineral and what makes up rocks? P.41 **(ES)** • Investigation: What are some characteristics of a mineral? P.43 **(ES)** • Investigation: How do crystals differ in shape? P.46 **(ES)** • URB P>40	• Minerals have a definite chemical makeup/composition • Each mineral has its own crystal structure • Minerals are grouped according to composition

3	**How are properties used to identify minerals?**	• Investigation; Hardness of minerals, p.56 **(ES)** • Investigation; 58-59 Mineral Identification, **(ES)** • Class discussion: Mineral Formation, reading diagram, p.63 **(ES)** • **Introduce density: No algebraic manipulations, just using concept and formula. This will again be used in grade 8.**	• A mineral's appearance helps identify it. • **Color and streak** • **Luster** • Mineral breakage help identify structure: **Cleavage and Fracture** • **Density and hardness** can be used to identify minerals • **Hardness** is measured on the **Mohs Scale**
4	**What is the rock cycle?**	• Text reference: 3.0 -3.4 P.72-103 **(ES)** • Investigation: How can rocks disappear? p.73 **(ES)** • Investigation: How do rocks differ from minerals? P.75 **(ES)** • Investigation: How can rocks be classified? P.77 **(ES)** • **URB P.153** • Class discussion: The rock cycle, pp.78-79 /Have students describe in writing the meaning of the diagram, p.79. **(ES)** • Class discussion: Crystal size and Cooling time, p.84 **(ES)** • **URB P.165**	• Teaching note: Using the Earth's Surface text (ES) for pages cited, review "Rock Cycle" with students. Students in grade four use FOSS kit, Earth Materials that lays a foundation for introducing or review ing the rock cycle. This is a foundation to begin "Plate tectonics" study. • The **Rock Cycle** shows how rocks change over time • **Igneous** rocks form from molten rock • **Sedimentary** rock forms from earlier rock • **Metamorphic** rocks form as existing rocks change.

9	**What is the geological evidence for plate movement?**	• Text reference: 4.0 -4.3,pp.110 - 137, **(CE)** • Investigation: How do you know what happened? P. 109, **(CE)** • Investigation: What can we learn from a rock? P. 111, **(CE)** • Investigation: Learning from tree rings, p. 116, **(CE)** • Class discussion: Assign groups rock layer photos in text and find evidence and claims from text, Section 4.2, pp.119-125, **(CE)** • Introduce half-life using an investigation of pennies and beans. Stary with fixed number of pennies and gradually change into beans by replacement. Emphasize graphing and time measured in "throws." Then connect to reading and discussion of text graph, "Dating Mammoth Bones",p.126**, (CE)**	• Earth's past is revealed in rocks and fossils • Rocks provide a timeline for Earth • Plate Tectonics theory explains the geological time scale of the earth's surface • Fossil evidence • Radioactivity evidence – Dating fossil evidence